

Book Reviews

A Short History of Neurology: The British Contribution 1660–1910. Edited by F. CLIFFORD ROSE. (Pp. 282; illustrated; £25 Paperback; ISBN 07506 4165 7.) Oxford: Butterworth-Heinemann 1999.

There is little doubt that until the beginning of the 20th century most advances in neurology originated in Europe. This little book is concerned mainly with British contributions to the subject and is based on a Symposium held to commemorate the 225th anniversary of the Medical Society of London. Pride of place is understandably given to the life and work of Thomas Willis (1621–1675) who, incidentally, was the first to use the term ‘neurology’.

Early developments in the subject centred on anatomical studies (Baillie, Charles Bell, Lizars, Hooper, Bright, Carswell), but subsequently the subject moved toward morbid pathology and the defining of clinical entities. For example Fothergill, who first identified the site of the lesion in trigeminal neuralgia (therefore sometimes referred to as Fothergill’s disease), and Parkinson who gave the first detailed description of the disease which now also bears his name. But as the editor himself writes, much of the history of modern British neurology begins in the second half of the 19th century, and here Marshall Hall was the author of one of the earliest textbooks on neurological diseases. Laycock and Hughlings Jackson pioneered the study of epilepsy and the origins of neurophysiology. J. Z. Young’s more recent studies of the giant axons of the squid led on to the work of Hodgkin and Huxley’s research and the foundation of our understanding of ionic changes in muscle membranes and ultimately the concept of channelopathies. Others who warrant special mention include Liveing (migraine), Ferrier (experimental neurology) and of course Meryon and Gowers (muscle disease).

In Germany, Griesinger advocated an association between neurology and psychiatry, though opposed at the time by Erb. In Britain the two specialities have, until recently, remained largely separate. But now with advances in molecular genetics and new imaging techniques the two are once again becoming more closely associated.

This is a very nicely produced book, well-illustrated and referenced. It provides an interesting and readable introduction to the study of the history of British neurology, and in fact is an important contribution to the subject. It can be highly recommended.

ALAN EMERY

Minds Behind the Brain: A History of the Pioneers and their Discoveries. By STANLEY FINGER. (Pp. xii, 364, illustrated; \$35 hardback; ISBN 0 19 508571 X.) New York: Oxford University Press. 2000.

The brain is arguably the last organ in the human body whose detailed structure in relation to function still remains largely unclear. The history of our present knowledge from earliest times is a fascinating story well-told in Finger’s recent book.

The ancient Egyptians considered the heart the central organ of the body and in fact discarded the brain during mummification. To the Greeks it was the seat of the soul with almost mystical properties. Though some details of its

structure began to emerge following the work of, for example, Alcmaeon of Croton and Herophilus, and much later Galen, it really was not until the 16th century with the pioneering careful anatomical studies of Vesalius that important facts first began to emerge. Later the 17th century saw the first serious approaches to understanding its function by Thomas Willis.

Apart from the ridiculous concept of skull morphology reflecting aspects of brain function by Gall in the early 18th century (so-called ‘phrenology’), it was Broca in 1861 who first drew attention to the speech centre after studying the case of a man with uncontrollable epilepsy and a serious speech defect (he could only say ‘Tan’ so this became the name by which he was known). At autopsy he was shown to have a ‘chronic progressive softening’ of the third frontal convolution of the left hemisphere which later became known as Broca’s area. Further areas of cerebral localisation (motor, somatosensory, visual, hearing, smell) gradually emerged either from studying patients with specific defects as a result of disease or trauma, or from experiments on animals in which Ferrier played an important role.

In the 19th century, however, attention began to turn to the minute structure of the central nervous system following the application of improved staining techniques by Golgi and Cajal. The concepts of the synapse, reflex arc, dermatomes, reciprocal innervation and more detailed studies of cerebral localisation emerged from the work of Sherrington, Adrian and Sperry. But as Sherrington admitted, behaviour could never be simply explained in terms of reflexes. As he stated to Lord Russell Brain on one occasion:

‘The reflex was a very useful idea but it has served its purpose. What the reflex does is so banal. You don’t think that what we are doing now is reflex, do you? No, no, no!’

Today we realise that there are many centres of motor and sensory activity. New techniques such as MRI (magnetic resonance imaging), PET (positron emission tomography) and MEG (magneto-encephalography) are beginning to reveal that these various centres are integrated in a very complex manner, and in a way which is still not clearly understood. In fact it seems that we are only now just beginning to realise the immense structural complexity of the brain.

The history of our knowledge of the brain up to the time of recent studies is told in a clear and interesting way. We see how ideas emerged through the lives and interests of those involved. It is a scholarly and well-referenced text, as well as being an excellent read.

ALAN EMERY

The Human Hippocampus. Functional Anatomy, Vascularization and Serial Sections with MRI. By HENRI M. DUVERNOY. (Pp. viii + 213; 255 figures; £95.50/\$159 hardback; ISBN 3 540 63205 0.) Berlin: Springer. 1998.

The first edition of this book was published in 1988. It was an exceptional work, well-researched and well-produced. The book was timely, for—stimulated by the advances in

MRI—research attention was just, at that moment, being turned to the hippocampus. The book provided vital anatomical detail for the MRI researchers of the period, and indeed, there could have been few neuro-research MRI scanning units which did not have a well-thumbed copy of Duvernoy at hand—ours certainly did, and very useful it always proved. The original book was based on the detailed dissection of 60 post mortem hippocampi, and the goal of the book was to provide a precise description of the hippocampus for neurosurgeons and for imaging.

Over 10 years have passed, and advances in this area have been profound. Hippocampal imaging has reached a level of sophistication which could not have been predicted, hippocampal surgery for epilepsy has become commonplace, and abnormalities of hippocampal structure have been implicated in a variety of different neurological conditions. The second edition of Duvernoy was therefore to be eagerly awaited, and I am pleased to say does not disappoint. It is still based upon the same 60 dissections, but much more detailed studies of vascularisation were carried out, and the dissections have been augmented by a series of excellent MRI studies. The chapter on structure and function has been greatly expanded. There is an interesting and important description of the principal pathways of the hippocampus and its connections. In the first edition, the functions of the hippocampus were described briefly; Duvernoy opened the section with the words: 'Functions of the hippocampus are controversial. Some accord it a basic role in cerebral functions, whereas others limit its spheres of activity.' In the new edition, a much greater space is devoted to function, and an anatomical view is taken. The mammoth neuropsychological literature on the subject is reviewed briefly, but it is difficult to escape the conclusion that this has contributed little of recent importance, and one senses Duvernoy's impatience with most of this work. The next section is concerned with anatomy, and the photographs of the anatomical specimens are laid out beside excellent line drawings (in colour now) that are clear and precise. The contrast of the photographic illustrations has been improved even where the same photographs were used in the original edition, and more detail has been added. There is now a very detailed chapter on vascularisation that is surely unequalled anywhere in the literature. There then follows a series of anatomical sections, beautifully prepared and labelled, some with illustrations of equivalent T1 weighted MRI sections. This interplay between anatomy and MRI is magnificently explored, and the illustrations are exquisite. So good is modern imaging, that the MRI scans and the anatomical sections are often very similar; the casual reader could easily mistake one for another. The book is a superb effort; a distillation of profound knowledge of the subject. The text is spare and unadorned, and always to the point. The illustrations are continuingly fascinating.

Is anything missing? One perhaps would have liked more on modern histology and neurochemistry, for these disciplines have contributed a considerable amount to hippocampal studies in recent years. The shunning of functional imaging and psychology reflects, one imagines, Duvernoy's impatience with these techniques. There is nothing flashy or overinterpreted about his own work, which is firmly based on anatomy and structure; he describes what he can see, and integrates his observations into a coherent and comprehensive whole. In reading this book one has the perception that the author probably knows his subject more comprehensively, with greater judgement, in more depth, and with greater accuracy than anyone else; what more can one ask? This is a definitive book, tremendous value and is strongly recommended.

SIMON SHORVON

Human Anatomy, 2nd edn. By FREDERIC H. MARTINI and MICHAEL J. TIMMONS. (Pp. xxxii + 844; fully illustrated in colour; £25.50 paperback; ISBN 0 13 849381 2.) London: Prentice Hall International. 1996.

Human Anatomy was first published in 1995 and the 2nd edition followed closely. The volume sent for review is the paperback reprint published as a lower-priced edition for countries outside the USA, Canada and Mexico with the worthy aim of producing books at a reasonable price for students in less affluent parts of the world. Unfortunately, a corollary of the welcome cheapness of the book was the fact that the reviewer's copy arrived with its spine split open.

It is a splendidly written book, designed mainly with nursing, paramedical and preprofessional students in mind, and for them it is certainly a comprehensive piece of work. Its atlas-sized format allows for large illustrations to be used, and the artwork is excellent. Clear, well coloured drawings of macroscopic, microscopic and submicroscopic anatomy, photographs of dissections, surface anatomy subjects and patients, x-rays, and an appendix of representative normal CT scans, enhance a clearly written text.

The subjects covered include topographical anatomy, histology, embryology and clinical applied anatomy. There are appendices on eponyms, the derivation of foreign words, a glossary of terms and summaries of learning objectives. A set of questions in each chapter allows self-assessment by the reader.

The authors, who are both experienced college teachers, together with their very skilful illustrators, are to be congratulated on producing a comprehensive and student-friendly textbook. The low price of this edition will certainly make it still more attractive to students and teachers in 3rd-world institutions.

HAROLD ELLIS

Wolf-Heidegger's Atlas of Human Anatomy, 5th edn. 2 Vols: vol. 1, *Systemic Anatomy, Body Wall, Upper and Lower Limbs*; vol. 2, *Head and Neck, Thorax, Abdomen, Pelvis, CNS, Eye, Ear*. By PETRA KOPF-MAIER. (Pp. xxi + 325 and xxiii + 453; fully illustrated in colour and black & white; DEM 150, \$130.50; ISBN 3 8055 5442 7.) Basel: Karger. 1999.

This well-known atlas was first published in 1954, originally under the title of *An Atlas of Systematic Human Anatomy* and in 3 volumes. This new fifth edition, in 2 volumes, is edited by the professor of anatomy at the Free University of Berlin. It has been extensively revised and supplemented, and now contains 586 figures of which three quarters are in colour. The text and figure subtitles are in German and English, while the figure labelling retains the Latin nomenclature. The index lists under all 3 languages.

Most anatomy teachers will be familiar with one or more of the previous editions, but there have certainly been extensive changes. The present volumes contain some 230 new, mostly topographic, illustrations and previous black and white drawings have now been coloured. Most of the 200 odd x-rays, (which include arteriograms), CT scans and MRI images have been replaced by new illustrations, which reflect the great advances made in these fields in recent years, and a number of ultrasonographic plates are now included. Sectional anatomical correlates are, of course, of

great importance in modern radiological teaching and practice, and the new figures include 90 anatomical sections arranged adjacent to the CTs and MRIs.

This is a beautifully executed atlas. The author and her team of artists are to be congratulated on having produced what will prove to be not only a valuable teaching aid to students and postgraduates, but also a pleasure to inspect on its artistic merits.

HAROLD ELLIS

A Guide to Dissection of the Human Body. By F. P. LISOWSKI. (Pp. xvii + 412; £22 paperback; ISBN 981 02 3569 0.) Singapore: Singapore University Press/World Scientific. 1999.

A good dissector should be thin, robust, and capable of withstanding the inevitable grease resulting from its use. Its print should be big, its instructions clear and, since one diagram is so much easier to take in than a paragraph of words, incisions should be illustrated by diagrams wherever possible. This A5 book is about 2 cm thick, printed on ordinary paper and entirely without diagrams. As well as the instructions themselves ('Clean the cephalic and basilic veins'), it includes expository text ('The dorsal mesentery is altered from its embryonic condition so that parts of the gut retain this mesentery while others lose it altogether'), objectives and self-study questions. It is thus more than simply a dissection manual, but yet not a stand-alone anatomy text. It makes little or no attempt to sift the more clinically important from the less clinically important, and it is written in an old-fashioned style with lots of third person and passive voice, which fails to engage the reader—at least it failed to engage me, although it is by no means unusual in that. It encourages students to search for many structures that students *may* (possibly) need to have heard of, but certainly do not need to find, e.g. inferior pancreaticoduodenal artery and styloglossus, to name but two.

This guide might be suitable for those anatomy courses where time for dissection is lavishly generous, but I did not think there were any such courses left. (The strange thing is that dissection practicals are the original self-directed, student-centred, problem-based, peer-group teaching sessions.) I cannot identify any group for which this book will be essential, and although it may have its good points, the book is no better than many others on the market at a similar price.

W. S. MONKHOUSE

Last's Anatomy, Regional and Applied, 10 edn. Edited by C. SINNATAMBY. (Pp. x + 539; £35 paperback; ISBN 0 443 05611 0.) Edinburgh: Churchill Livingstone. 1999.

Now here's an unusual thing: a new edition that is shorter than the previous edition. This is very much a revision and slimming-down rather than a fundamental rethink. The Sinnatamby order of events is the same as the McMinn and some random forays indicate that the Sinnatamby text is much sparer with less of the expansive floral decoration: for example, things like McMinn's 'the uppermost limit of the insertion of the posterior leaf [of pectoralis major, sternocostal head] is, by a crescentic fold, into the capsule of the shoulder joint' has been much simplified, to its great benefit,

and fantasias into embryology, like McMinn's 'there is some doubt about how much of pectoralis major is developed from the limb bud' have been expunged completely (this question keeps me awake). The Sinnatamby diagrams are familiar, with one or two new ones, and there are valuable radiographs to illustrate the text.

Everything of clinical relevance is covered, and my only gripe is that, I suppose for the sake of completeness, there is still some 'so-what' anatomy such as the attachments of all the facial muscles: we wait for someone to take the plunge and state that some anatomy is not clinically important. The biographical nuggets at the end are still there (hooray!) and so are the eponyms, which is jolly good news for those of us who would like to consign the dry-as-dust pedants of the *Nomina Anatomica* to the nether regions.

This is a very good book.

W. S. MONKHOUSE

Principles of Anatomy and Physiology, 9th edn. By GERALD G. TORTORA and STANLEY REYNOLDS GRABOWSKI. (Pp. xxxiv + 2063; includes CD-ROM; fully illustrated in colour and black & white; £28.50 hardback; ISBN 0 471 36692 7.) Chichester: Wiley. 1999.

I know that some medical anatomy and physiology courses recommend this book and, like every other book on the market, it is satisfactory in many areas. Anatomy and physiology are sensibly and seamlessly linked. Numerous clinical examples illustrate the pathobiology of disease, and many of these stray into therapeutics and other clinical areas. There are plenty of self-assessment questions and, with the lavish colour illustrations, the publication is attractive. The subject matter is organised on a systems basis (muscular, nervous, cardiovascular, respiratory, etc.) which is fashionable and suits the limited areas of knowledge of specialised researchers who are dragooned into teaching. Unfortunately, though, a systems-based approach is of only limited value when it comes to the clinical situation. For example, a cancer of the pharynx does not know that it is supposed to be limited to the alimentary system and so it might present as earache, and a multitude of other examples could be given of how a regional approach to anatomy would be valuable. Clinical neuroanatomy is included in some detail, although the treatment of the clinical aspects of cranial nerve biology is poor. There is little or no practically relevant surface anatomy, and this is a big drawback as far as I am concerned.

The whole Tortora package includes a professor's resource manual (lecture notes), an atlas of human dissections with selected specimens from the cat, sheep and cow, an illustrated notebook which has diagrams on one side and space for notes on the other, a learning guide (questions and answers) and a test bank (more questions, answers and page references to the main text). There is a website with all sorts of other bells and whistles and it's overwhelming. If you are a teacher who does not want to have to think the material through for yourself, this is for you.

From the point of view of vocational teaching, my major complaint is that, as is so often the case, there is no attempt to distinguish scientific detail that matters clinically from detail that does not. This is perhaps not surprising since, according to the blurb, neither author is, or has been, a practising clinician. The general clinician needs to know some aspects of the basic sciences in detail, while others need

only be covered in the broadest of broad brushstrokes. With this book, as with so many others, the poor student is left thinking he or she needs to know a great deal of material that is of absolutely no practical importance whatsoever.

All this having been said, if a student knows what is in this book, he or she will be doing well. But if I were a student I would prefer smaller, more analytical books that helped me to sort the nice-to-know from the need-to-know. If I were to buy a book of this size, I would (and did) buy the reference tome in the subject that interested me.

W. S. MONKHOUSE

Microanatomical Aspects for Neurosurgeons and Neuroradiologists. By WOLFGANG SEEGER, in collaboration with J. ZENTNER and M. SCHUMACHER. (Pp. vii + 423; 201 partly coloured illustrations; \$298/DM 498 hardback; ISBN 3 211 83376 5.) Berlin: Springer. 2000.

This is a quite remarkable book. First, physically: considerably larger than old-style foolscap, it runs to over 420 pages. Second, for quality of production: its royal-blue hardback binding (and dust-jacket) enclose two hundred full-page glossy coloured plates (on acid- and chlorine free paper), almost all of which consist of at least 2 separate diagrams. Third, as evidence of amazing fecundity: the innumerable drawings or paintings are not only signed by one person—the first author—but those forming the first three quarters of the book all are dated '98', the rest '99'; J. M. W. Turner himself would hardly have been ashamed to count this as a year and a bit's outpouring!

The onlie begetter, a descendant of 'farmers, craftsmen, theologians and painters', retired from his post as neurosurgeon only one year before this *annus mirabilis*. Drawing, along with his 'spacious garden' with its 'splendid opportunities to observe the delights of nature', is obviously a beloved hobby. Professor Seeger appears to distrust new-fangled ways of presenting anatomical detail since, in addition to peroperative views and his own cadaver dissections, his drawings and sketches reinterpret not only x-ray computed tomographic and magnetic resonance imaging sections, but photographs and ceramic casts as well. The quality of the illustrations, like those of one's anatomy teachers 40 years ago, is very variable, and one cannot avoid the suspicion that, while they do appear to be accurate, simply reproducing the originals from which they were derived would not only have guaranteed accuracy, but could have been more instructive, particularly as the book is explicitly directed at the people who use clinical cross-sectional images every day.

The bulk of the book is divided into 4 sections of approximately equal extent: 'cerebral hemispheres and upper brain stem' (largely about techniques of craniotomy, and the optic nerves and chiasm); 'midline area'; 'temporal area', especially temporal lobectomy; and 'rhombencephalon and surrounding structures'. As these headings may suggest, both the text and the captions use a mixture of everyday and classical anatomical nomenclature; foramen of Monro is just as likely to appear as *Foramen intraventriculare Monroi*; indeed, in Figure 14 the two are to be found on facing pages.

When not simply captions, the text seems to consist of operative tips, the majority of which one would have thought familiar to many neurosurgeons in training. I doubt that together they form a textbook of operative surgery, and

the use of 'microanatomical' in the title is somewhat misleading; much of the detail is on a grosser scale. Professor Seeger is meticulous in ascribing descriptions of specific problems (including unwelcome complications) encountered during surgery, to his many colleagues! The translation (by Dr Hardenack of Bochum) is workaday at best, occasionally risible, but usually, like the title of the book, comprehensible: 'Hemiparesis may occur nonetheless [sic] by lesions of motoric fibers'. 'Topogram' is used consistently to describe a diagram which illustrates the level shown in a drawing perpendicular to it, apparently without realising that this is a commercial term limited to one (German) manufacturer of imaging equipment. I was, however, distinctly taken by 'normvariant', a neologism I may well adopt.

Despite the dating of the drawings, the Preface indicates that Professor Seeger has spent some 21 years working with Springer-Verlag, and an advertisement at the back of the book lists more than a dozen previous collaborations. I cannot guess how many copies of *Microanatomical Aspects* will sell at approximately £200, but it is probably more important that this remarkable publication clearly fulfilled a deeply-felt wish.

IVAN MOSELEY

The Aquatic Ape Hypothesis. By ELAINE MORGAN. (Pp. 205; some figures; £16.99 hardback; ISBN 0 285 63377 5.) London: Souvenir. 1997.

In *The Aquatic Ape Hypothesis*, Elaine Morgan presents again her ideas about an aquatic stage in human evolution. It is now some 20 years since Elaine Morgan, a science journalist, first expounded her ideas, developed from suggestions made by Alistair Hardy (1960), in *The Descent of Woman* and *The Aquatic Ape*. Her views about some aspects of the theory have changed. Salt in our tears and sweat no longer considered as an ancestral adaptation for removing excess salt acquired from a marine environment. A largely aquatic environment is replaced by a 'mosaic' of water and marshland interspersed with trees. Despite these and other modifications, Morgan's enthusiasm for her ideas remains undimmed and the theory is gaining support from a scientific community which, on the whole, had seemed to hope that Elaine Morgan and her theory would go away if ignored long enough. Theories of hominid evolution based on sparse fossil and geological evidence combined with inferences from comparative anatomy are unlikely to reach a certain conclusion. But central pillars supporting the theory have stood the test of time. The argument for a littoral or lakeside environment for early bipedal hominids has been strengthened by the discovery that the location of a series of key fossils matches the margins of the ancient Sea of Afar, and that they were deposited along with other aquatic fauna. Compared to the savannah, a partly aquatic environment would have been far more friendly to an emergent and probably rather inefficient bipedalist like Lucy—the most famous fossil of the period. Studies of the migration route of early *Homo sapiens* out of Africa in much more recent times are now thought to have followed a coastal route (Knight, 1991) and many sites of upper palaeolithic habitation are close to water. Human evolution may therefore have been closely associated with water for between 3 and 8 million years. As a zoologist turned cell biologist, I have always been struck by the unusual structure of human skin. Morgan points out its resemblance not to our primate relatives but to more distant

aquatic mammals like hippopotamus, whales and seals. Lack of hair, abundant fat (particularly in babies) and unusual distribution and type of sweat glands makes human skin unique and suggests a link with an aquatic past. An association of such odd features with an arid savannah environment is harder to explain. Sceptics will always be able to criticise a theory based more on inferences and comparative anatomy than on more solid evidence. However, the argument now seems to be swinging in Morgan's favour. At the very least, we should be stimulated by her efforts to link an aquatic past with human features as diverse and hard to explain as the length of the human menstrual cycle, the anatomy of our nose and larynx, the size of the human penis and our mode of copulation, and the brain content of polyunsaturated fatty acids. Not to mention our, or should I say my, love of just sitting and staring at water.

T. COWEN

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Instant Anatomy, 2nd edn. By ROBERT H. WHITAKER and NEIL R. BORLEY. (Pp. xi+205; fully illustrated; £12.95 paperback; ISBN 0632054034.) Oxford: Blackwell Science. 2000.

Instant Anatomy was first published in 1994 and soon became a popular pocket Anatomy, both with medical students and with candidates working towards their Part 1 of the MRCS examination. Its 2 authors are well known teachers and surgeon-anatomists. This 2nd edition has allowed some errors and omissions in the previous edition to be corrected and the section on that difficult topic, the autonomic nervous system, has been expanded.

The first 7 sections cover the blood vessels, lymphatics, the autonomic system, the cranial and spinal peripheral nerves, dermatomes and cutaneous nerve distribution. These sections are characterised by clear coloured diagrams (Robert Whitaker's well known artistic skills come into play here), which have the great virtue of tracing each structure in its entirety, with its branches and distribution clearly shown—something that may often require a deal of searching for in standard reference volumes.

The remaining sections cover a list of the muscles, with details of their origin, insertion, innervation and function, a list of the joints, with brief accompanying notes, ossification times, the foramina of skull and spine, anatomical spaces, the vertebral levels of important structures and finally the pharyngeal derivatives. These last lists are what conscientious students would have constructed for themselves in the 'bad old days'—and perhaps the hard-working ones still do! The viscera and the central nervous system are not included. A book of this size cannot include yet more detail and so it is almost inevitable that anatomical variations (such an important concept in Clinical Anatomy), can only be hinted at.

So we welcome a new edition of this useful reference book. It will remain popular with both students and with surgical postgraduates; it will certainly be blessed by them in their pre-examination revision.

HAROLD ELLIS

Extracellular Matrix Protocols. Edited by CHARLES H. STREULI and MICHAEL E. GRANT. (Pp. xiv+370; illustrated; \$89.50 hardback; ISBN 0 896 03624 3.) Totowa, New Jersey: Humana. 2000.

The perception of the function of the extracellular matrix (ECM) has changed considerably during the last decade. Initially its function was thought to be a mere scaffold to hold the cells together to form a tissue. Advances in cell and molecular biology made it clear that the ECM is additionally governing the direction of cellular movement and promoting cell survival, proliferation and differentiation. While formerly more simple methods have been used to study the assembly of the ECM, the development of new technologies has enabled into the dynamics of the ECM formation and degradation. This book is divided into the 4 following parts: biochemistry of the ECM, biophysics of ECM proteins, molecular biology of ECM genes, cell biology of the ECM. Common to all chapters is their format consisting of an Introduction, a Materials section, followed by a Methods section to which a Notes section is added. This Notes section is a particular feature of this series which hints at and discusses problems and pitfalls of a particular step within the experimental protocol. As it is stated in the preface, this book was designed as a complement to an earlier volume on ECM matrix protocols published by IRL. The complexity of the methods described and the often quite expensive and specialised laboratory equipment needed for the experiments makes this book, with a few exceptional chapters, unsuitable to the novice in the field who has no in depth laboratory backup. For the more experienced researcher with specific needs this book is an excellent state of the art collection of practical protocols and is highly recommended.

UDO SCHUMACHER

Biology of Sensory Systems. By C. U. M. SMITH. (Pp. x+445; fully illustrated; £39.95 paperback; ISBN 0 471 85461 1.) Chichester: John Wiley. 2000.

The book is drawn from the experience of teaching undergraduate students in biology, and more recently optometry, and is designed to meet their needs. Self-assessment questions and a bibliography conclude each of the 6 parts which are composed of 3 to 5 chapters; references are not included in the text. It is generously illustrated, mainly with line drawings. The introductory first part consists of basic cell biology, electrophysiology, taxonomy and general features of sensory systems. Part 2 covers mechanosensitivity, 3 deals with chemosensitivity, part 4 covers photosensitivity and part 5 deals with other senses, grouping together infrared, polarised light, electrical and magnetic field and thermosensitivities and pain. The final part, or coda, summarises and identifies commonalities among the systems and concludes with a philosophical postscript. The text is written in a relaxed manner that complements the appeal of the subject and evolution and, untypically of the genre, molecular biology are added to the core neurobiology. Frequent philosophical observations impart a further distinction to the character of the book. One's attention is drawn to fundamentally similar structures, molecular and cellular, serving disparate modalities and none is more striking than the ubiquitous hair cell.

More than a third of the book is used to cover photosensitivity, mostly dealing with the human visual system but with sections on invertebrate and other vertebrate eyes. No doubt its length represents an expansion to cater for optometry students, and there is at least a hint that the author was pleased to leave the rest of the eye and its appendages for the retina and the remainder of the visual pathway. Two ocular diseases arbitrarily chosen for brief consideration appear out of place, while retinotopic pro-

jections, of interest to both biology and optometry students, are ignored.

The style and content of the text will undoubtedly appeal to biology undergraduates, although they may find the account of the visual system disproportionate, but it is not the sort of book a medical undergraduate is likely to find the time for and the needs of students of optometry are only partially met.

G. L. RUSKELL